

Remarks

Applicants thank the Examiner for carefully considering the subject application.

Applicants first would like to point to the request for deferred examination properly filed on January 30, 2004. Applicants request that such petition be honored in this case.

Regarding the Office Action, Applicants submit herewith corrected Figures 1b, 3, and 5 to overcome the formality objections raised by the Examiner. Further, Applicants have also corrected various typographical errors in the specification.

Turning now to the substantive Rejections, Applicants believe some brief background information may be useful. As discussed in Applicants' specification, the present application relates to the issue of optimal scheduling of valve operation, such as valve opening timing, closing timing, or lift, for example. Further, the inventors of the present application have also recognized that there can be competing objectives between avoiding engine misfire conditions, and obtaining improved fuel economy with variable valve operation mechanisms. See Applicants' specification at page 15, line 9 to page 16, line 8.

Amendments to the Drawings

The attached sheets of drawings includes changes to Figure 1B, 3 and 5. This sheet replaces the original sheets including Figures 1B, 3 and 5.

Attachment: 3 Replacement Sheets

The cited references give no guidance as how to solve these apparently irreconcilable goals. In contrast, Claim 18 provides one example approach. Claim 18 claims:

A system for vehicle, comprising:

- an internal combustion engine coupled to the vehicle having a cylinder, said cylinder having at least an adjustable valve;
- a humidity sensor coupled to the vehicle; and
- a controller for, at least under some conditions, sending a first signal to said adjustable valve to operate said valve in a first condition during a first reading from said sensor and sending a second signal to said adjustable valve to operate said valve in a second condition with less dilution during a second reading from said sensor, where said second reading indicates a higher humidity than said first reading.

One example for creating such operation is described in Figure 4. As shown by the equations and the corresponding text, as humidity increases, valve timing is adjusted to obtain less dilution.

In this way, it may be possible to provide increased fuel economy and reduced emissions. For example, engine operation may be improved across various conditions by taking into account variations of ambient humidity and its effect on engine misfire and its interaction with adjustable valve operation. See Applicants' specification at page 3, for example.

In applying the prior art, the Examiner states at page 3:

Kanehiro et al. disclose a system for internal combustion engines comprising:

- a humidity sensor 32 for detecting the humidity of the air and relaying a signal to the electronic control unit ECU 5 (column 9, lines 32-36) which has a CPU 5b (column 10, lines 8-18);
- ECU 5 and CPU 5b determining operating conditions of the engine based on signals from various sensors (column 9, lines 62-64, column 10, lines 15-24);
- CPU 5b supplying driving signals based on parameter calculations to a valve timing changeover apparatus 40 (column 22, lines 5-10);
- the valve changeover device 40 changing the valve timing of the intake and exhaust valves or the valve lift amount (column 20, lines 66-68 with column 21, lines 1-5, and Figure 16);
- an engine having a camshaft (column 9, line 15).

First, Applicants note that the Office action does not assert that the humidity sensor in Kanehiro et al. is specifically used to adjust cam profile. As such, even assuming that Kanehiro et al. shows all that is asserted, there still is no disclosure that the humidity sensor is used to adjust cylinder valve operation.

Second, Applicants respectfully submit that there is no disclosure in Kanehiro et al. of any valve adjustment based on a parameter indicative of humidity. Further, there is no disclosure of how to use humidity to adjust valve operation.

Regarding claims 1-16, in addition to the comments above, Applicants have rewritten claim 12 to include the limitations similar to that of claim 15, and therefore it should be allowable. Further, Applicants have rewritten claims 1 and 17 to include similar limitations, and therefore they should be allowed.

Based on the foregoing comments, the above-identified application is believed to be in condition for allowance, and

such allowance is courteously solicited. If any further amendment is necessary to advance prosecution and place this case in allowable condition, the Examiner is courteously requested to contact the undersigned by fax or telephone at the number listed below.

Please charge any cost incurred in the filing of this Amendment, along with any other costs, to Deposit Account No. 06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1505. A duplicate copy of this sheet is enclosed.


CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop AMENDMENT, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on August 30, 2004.


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Respectfully submitted,

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